

Polyhydroxyalkanoate levels as an indicator of bioreactor health

Description of Technology: A method has been developed to monitor the health of an activated sludge environment in a wastewater process comprising monitoring the levels of polyhydroxyalkanoates (PHA) produced and correlating those levels with various selected sample parameters. In general, levels of PHA in excess of about 15% to about 20% dry weight of the biomass is an indication that the biocatalytic efficiency of the wastewater treatment process is impaired.

Patent Listing:

1. **US Patent No.** 6,737,263, Issued on May 18, 2004, "Polyhydroxyalkanoate levels as an indicator of bioreactor health"

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Market Potential: A number of devices and systems to process and purify water from industrial operations and municipal sources prior to discharging the water are known. Activated-sludge wastewater treatment plants, which are well known in the art, have been most often utilized to address this problem. Additionally, many industrial and municipal water treatment plants utilize biological systems to pre-treat their wastes prior to discharging into the usual municipal treatment plant. In these processes, the microorganisms used in the activated sludge break down or degrade contaminants for the desired water treatment. Efficient process performance and control requires quick and accurate assessment of information on the activity of microorganisms. This has proven to be a difficult task in view of the wide variety of materials and contaminants that typically enter into treatment systems. Variations in the quantity of wastewater being treated, such as daily, weekly or seasonal changes, can dramatically change numerous important factors in the treatment process, such as pH, temperature, nutrients and the like, the alteration of which can be highly detrimental to proper wastewater treatment. Improperly treated wastewater poses serious human health dangers. It is imperative therefore to maintain the health and biocatalytic efficiency of these activated sludge systems.

The problem to be solved, therefore is to provide a facile, highly responsive method of monitoring activated sludge environments to rapidly predict loss of denitrification activity and other indicators of biocatalytic efficiency such as the concentrations of nitrate, ammonia, sulfate, phosphate and carbon dioxide in the system.

Benefits:

- Highly responsive method of monitoring activated sludge environments
- Indicates concentrations of substances in the system

Applications:

Indicator of bioreactor health